

A new species of *Chaetagnlaea* (Lepidoptera, Noctuidae, Noctuinae, Xylenini), from eastern North America

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Abstract

Chaetagnlaea tremula (Harvey) occurs through the Gulf States, from southern Florida, west to eastern Texas. Coastal populations, previously referred to *Chaetagnlaea tremula* occurring from the Carolinas, at least as far north as Massachusetts and shoreline dunes in southwestern Ontario are recognized as distinct and described here as *Chaetagnlaea rhonda*. Adults and genitalia are illustrated for *Chaetagnlaea rhonda* and *Chaetagnlaea tremula*.

Keywords

Chaetagnlaea tremula, *Chaetagnlaea rhonda*, dunes, taxonomy

Introduction

Since the early 1990s, the senior author has been studying the Lepidoptera of Pinery Provincial Park and adjacent areas of Lambton County, Ontario. As a result of this work, many undescribed species and new species for Canada, were found. One such species is *Chaetagnlaea rhonda* sp. n., which is associated with sand cherry (*Prunus pumila* L.) on Lake Huron's foreshore dunes in Lambton County. This species was first discovered in Lambton County, by Ken Stead and Dr. Kirk Zufelt in 1993 and remains the only site at which *C. rhonda* is known to occur in Canada. At the time of

its discovery in Canada, it was identified as *C. tremula*; however, although specimens from Florida, Louisiana, and Mississippi submitted to BOLD for DNA analysis are *C. tremula* (TL “Texas”), those from Ontario, coastal North Carolina, and coastal Massachusetts represent an undescribed sister species to *C. tremula*. In order that a name be available for biodiversity inventories and conservation work, we describe this new species as *Chaetagnalea rhonda*.

Materials and methods

Procedures for the dissection and preparation of genitalia and terminology for genital structures and wing markings follow that of Lafontaine (2004). Molecular variation was assessed based on the 658 bp ‘barcode’ region of the first subunit of the cytochrome oxidase (*cox1*) gene (Hebert et al. 2003). DNA was extracted from one leg removed from a dried specimen, sent to and processed at the University of Guelph through the Barcode of Life Data systems (BOLD; www.lepbarcoding.org). DNA extraction, amplification and sequencing protocols for the Barcode of Life initiative are detailed in Hebert et al. (2003). Molecular sequence data were compared with phylogenies constructed using the neighbour-joining method, and distance calculations were performed using the Kimura 2-parameter (K2P) distance model as implemented on the BOLD website.

Systematics

Chaetagnalea rhonda sp. n.

<http://zoobank.org/4E3DF077-C472-476A-A6F3-863A8580448F>

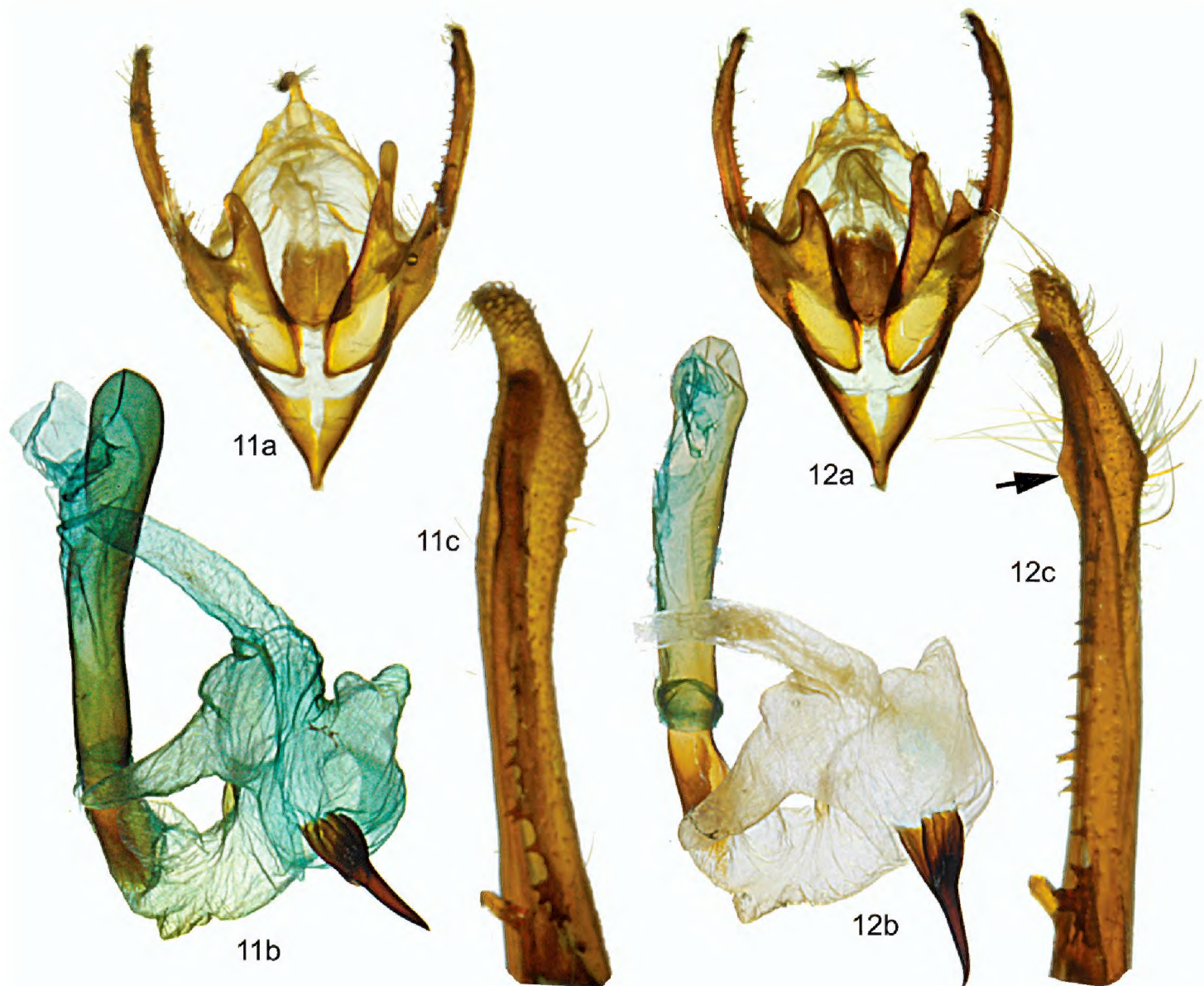
Figs 1–3, 11, 13

Diagnosis. *Chaetagnalea rhonda* is closely related to *C. tremula* (Figs 4–10). There appears to be very little individual variation within populations of *C. rhonda*. At the type locality in Ontario, all specimens have a gunmetal gray forewing with concolourous subterminal band and dark gray-brown hindwing. However, significant variation is present between populations. In coastal North Carolina, specimens of *C. rhonda* are slightly larger (forewing length 21–22 mm vs. 18–19 mm) and the forewing is brick red with a slightly darker, browner hindwing (Fig. 3) than populations in Ontario. Among the reddish North Carolina specimens examined there appears to be little variation. *Chaetagnalea tremula* exhibits tremendous individual variation (Figs 4–10) with the forewing varying from brick red to tan, brown, or black. The subterminal area of the forewing of *C. tremula* can be concolourous with the ground colour of the forewing or much paler. Due to this variation it is difficult to provide external characters that reliably separate the species; however, in *C. tremula*, the anal margin of the forewing normally has a pale beige line, bordered by a brick red fringe. In *C. rhonda*, the



Figures 1–10. Adults of *C. rhonda* and *C. tremula*. **1** *C. rhonda*, male, Port Franks, ON **2** *C. rhonda*, female, Port Franks, ON **3** *C. rhonda*, female, Carolina Beach State Park, NC **4–10** *C. tremula*, Ocala National Forest, FL.

ground colour of the forewing extends to the posterior margin, which is bordered by a distinct red fringe. Internally, in *C. tremula* the costal margin of the valve is produced dorsally to form a short, subapical pointed ridge (see Fig. 12c). In *C. rhonda* this sub-



Figures 11–12. Male genitalia of *C. rhonda* and *C. tremula*. **11** *C. rhonda*: **a** armature **b** aedeagus with vesica everted **c** tip of right valve **12** *C. tremula*: **a** armature **b** aedeagus with vesica everted **c** tip of right valve; arrow shows subapical ridge absent in *C. rhonda*.

apical ridge is absent. The dorsal processes of the sacculus are asymmetrical in both species, but are noticeably longer in *C. rhonda* (Fig. 11a) than *C. tremula* (Fig. 12a). The female genitalia of *C. rhonda* are roughly similar to those of *C. tremula*; however, the distal sclerotized section of the ductus bursae of *C. rhonda* (Fig. 13) is slightly longer and narrower than that of *C. tremula* (Fig. 14). DNA sequence data are congruent with the morphological data, showing that of the 658 COI base pairs examined, there is a 2.44% difference between *C. tremula* (Florida, Louisiana, and Mississippi) and *C. rhonda* (Ontario and North Carolina).

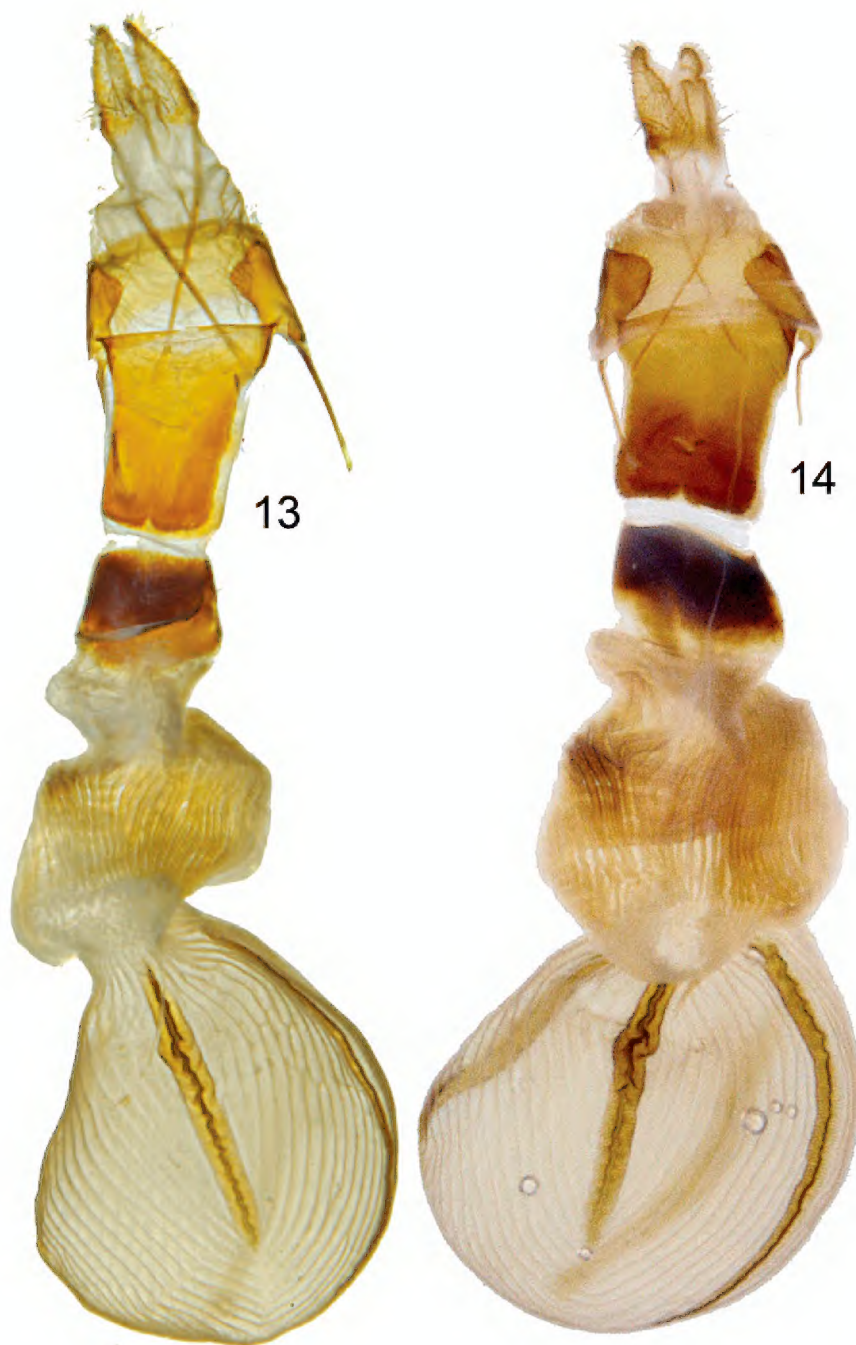
Description. Males and females similar. **Holotype.** Antennae filiform, ciliate; palpi red; head, vertex, prothoracic collar, thorax, and abdomen gray. Forewing length 19mm. **Dorsal forewing** glossy gunmetal gray (brick red in specimens from the Atlantic coast) with numerous black scales, costal and posterior margins red; darker gray antemedial and postmedial lines evenly concave from costa to vein CuA2, where both

lines turn slightly toward outer margin; subterminal line slightly lighter gray than ground colour, scalloped between veins below vein M3; between veins M3 and R5 line evenly convex, terminating closest to outer margin on vein R5 and then bending inward toward costa. Black scales occur along anterior margin of subterminal line forming a distinct black spot in cell M5; these black scales gradually fade between vein M5 and costa and below vein M1. Outer margin with a series of black dots between veins; orbicular and reniform spots poorly demarcated by thin gray lines; a black dot occurs in lower margin of reniform spot; fringe gray. **Dorsal hindwing** dark gray brown with concolourous fringe. **Male genitalia.** (Fig. 11) Uncus narrow, terminating in fine hook. Juxta more-or-less rectangular with concave dorsal margin. Saccus with ventral triangular process and elongate, finger-like dorsal process, left process much longer than right. Valve excavated above saccus, leaving elongate, narrow arm terminating in setose, bubble-like, membranous cucullus. Heavily sclerotized costal margin with row of medial teeth terminates in short, subapical claw. Ampulla of clasper finger-like, extends dorsally above costa of valve. Vesica bends ventrally to the right with small sclerite on dorso-anterior margin of bend and large, posterior, bulbous, thorn-like cornutus. Two small sub-basal diverticulae on right extend to anterior and posterior; apical diverticulum terminates in ductus seminalis, above which a globular subapical diverticulum on right splits into elongate dorsal and posterior arms; a bulbous diverticulum occurs on left and a short, bi-lobed diverticulum arises from ventral surface. **Female genitalia.** (Fig. 13) Ovipositor lobes pointed with scattered setae; sclerotized plates occur on ventral and dorsal surfaces of ductus bursae between ostium bursae and a 0.5mm unsclerotized section, after which a second pair of sclerotized plates occur anterior to appendix bursae; appendix bursae with a thickened, almost leathery wall, the surface of which is very lightly sclerotized on the ventral side; ductus seminalis arises on ventral surface of appendix bursae at corpus bursae; corpus bursae egg shaped with prominent ridges and four elongate signa.

Type material. **Holotype** male: Canada: Ontario, Port Franks, [Lambton County], 43.226 N 81.923 W, 17 ix 2015, J. Troubridge and K. Stead, in the Canadian National Collection of Insects, Arachnids, and Nematodes, Ottawa, Canada. **Paratypes:** 13 males, 11 females: same data as holotype.

Etymology. We take pleasure in naming this species to honour Rhonda Landry, who gave support and encouragement to the authors by providing us with good food, coffee and conversation. It is a noun in apposition.

Distribution. In Canada, this species is presently known only from dunes along the shore of Lake Huron in Lambton County, Ontario. In the United States, we have examined specimens from Carolina Beach State Park, New Hanover County, North Carolina. Additional specimens of *C. rhonda* have been submitted to BOLD for DNA analysis from the Frances A. Crane Wildlife Management Area, Barnstable County, Massachusetts, and Pine Knoll Shores, Carteret County, North Carolina. Each of these US sites are close to the Atlantic beaches and we expect that *C. rhonda* occurs in suitable habitats up and down the Atlantic seaboard.



Figures 13–14. Female genitalia of *C. rhonda* and *C. tremula*. **13** *C. rhonda* **14** *C. tremula*.

Acknowledgements

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